Compliance Responsibility And Allowance Allocation In A CO_2 Emissions Cap-and-Trade Program For The Electricity Sector In California

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Resources for the Future
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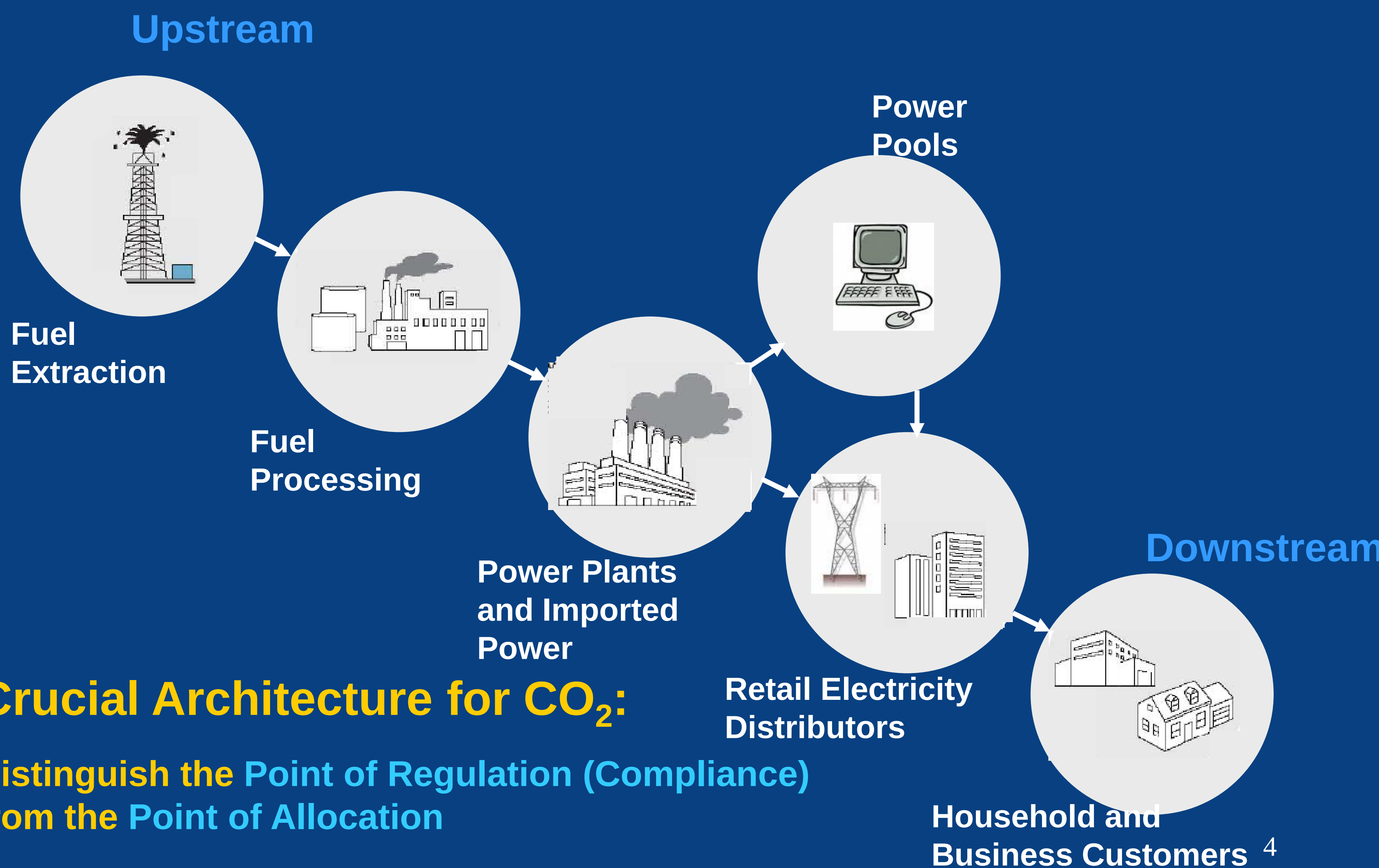
Introduction

- Global Warming Solutions Act (AB 32) requires California to reduce aggregate GHG emissions to 1990 levels by 2020
- ARB Draft Scoping Plan indicates that cap-and-trade will be important component of state GHG policy
- Point of compliance and method of allocation are two important policy parameters
- The electricity sector is particularly important
  - Source of low cost reductions?
  - Focus of past cap-and-trade programs
  - Power imports need to be considered

A) Point of Compliance

Where in the Electricity Fuel Cycle Should GHG Policy be Enforced?



Crucial Architecture for CO_2:

Distinguish the Point of Regulation (Compliance) from the Point of Allocation

Where in the Electricity Fuel Cycle Should GHG Policy be Enforced?

- Upstream? If not, then one of the following:
- Source-Based Approach (SO_2, NOx, EU ETS)
- Load-Based Approach (PUC's initial approach)
  - Load serving entity would have to surrender allowances for emissions used to meet load
- First-Seller (First-Deliverer) Approach (MAC recommendation, PUC's recommendation)
  - Entity that first sells power onto the CA grid. For instate generation it is sources/marketers
  - For imported power it is the party identified on transmission documents
- YUCK! Who CARES!!!

Criteria for Evaluation

1. Effect on PUC activities/policies to promote energy efficiency and clean power
2. Impacts on Customers and Producers
3. Treatment of Power Imports
4. Ease of Administration
5. Fit with Electricity Market Reform
6. Integrity of Emissions Market
7. Influence on Federal and Regional Policy
8. Legal Issues

Criteria for Evaluation

1. Effect on PUC activities/policies to promote energy efficiency and clean power
2. Impacts on Customers and Producers
3. Treatment of Power Imports

No Difference

4. Ease of Administration
5. Fit with Electricity Market Reform
6. Integrity of Emissions Market

First Seller

7. Influence on Federal and Regional Policy
8. Legal Issues

Uncertain

Further Thoughts: First-Seller Approach

- PUC programs/policies with environmental and energy efficiency goals could continue independent of point of compliance.

- LB compliance doesn’t fit with a well functioning emissions market. Imprecise link from load to emissions creates poor incentives and weak accountability undermines incentives.

- LB allocation has been justified as a way to soften electricity prices, but this is done through <u>allocation</u> not compliance obligation.

B) Method of Allocation

How Should Allowances Be Allocated?

- Free Allocation to Emissions Sources (SO_2, NO_x, ETS phase I)
  - Could be based on emissions, generation or heat input
- Free Allocation to Local Distribution Companies
  - Could be based on sales, population, emissions
  - Could take form of allocation of allowance value from an auction
  - Could substantially reduce retail electricity price effect, but at an efficiency cost
- Auction with Revenues to Government (ETS phase III, RGGI, some recent federal proposals)
  - Revenues could be used to support program goals, reduce taxes or returned directly to consumers

Matrix of Scenarios Analyzed

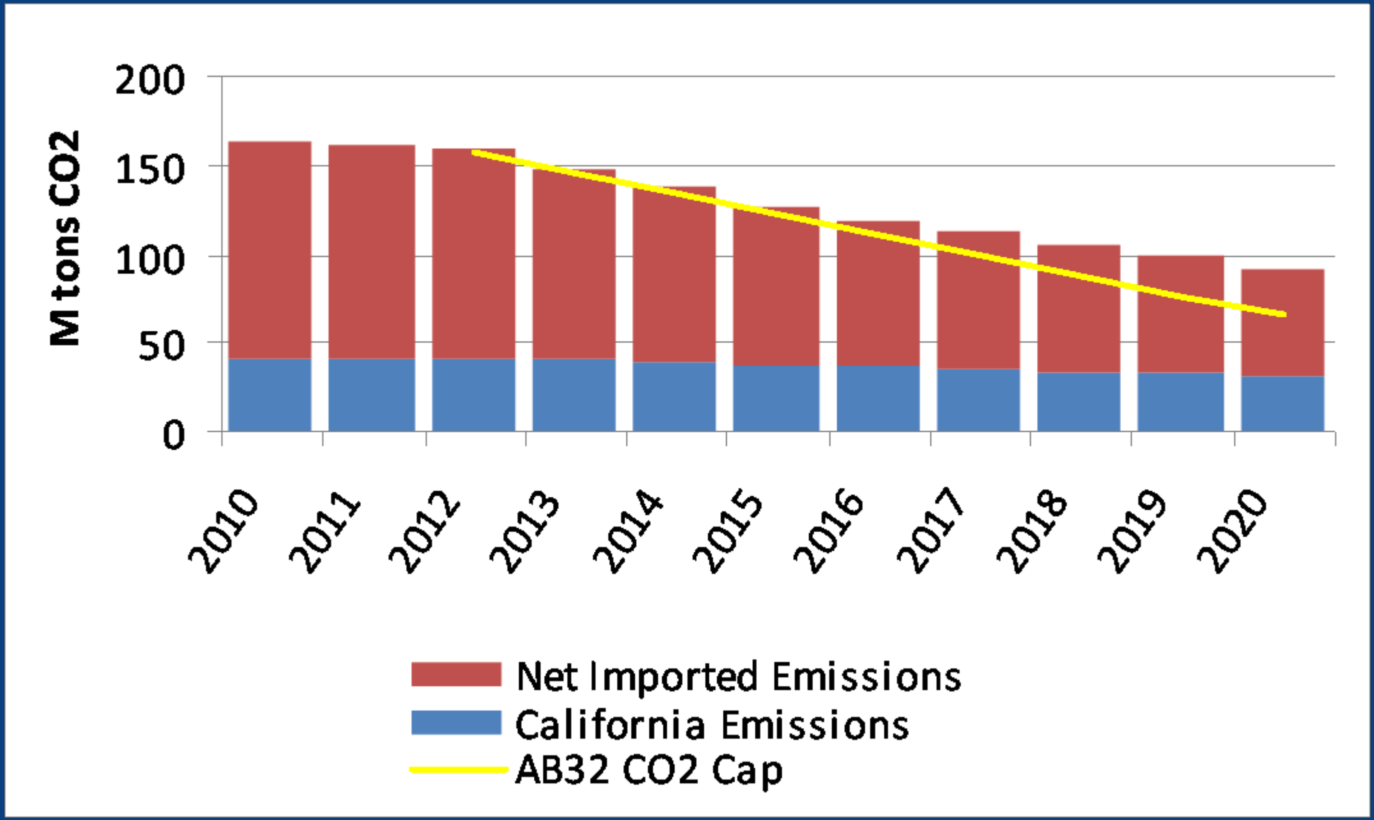
Scope / Allocation	California Only	Modified WCI
Auction	X	X
Load-Based Allocation	X	X

Haiku Electricity Market Model

- 21 Haiku Market Regions with inter-regional trading
  - CA has two regions: North and South
- About 48 model plants in each region.
- 3 seasons, 4 time blocks, 3 customer classes.
- Price responsive demand and fuel modules.
- EIA demand forecast with elasticity parameters from literature; EIA fuel price forecast.
- Technology characteristics and cost data from EIA, EPA and some industry sources.

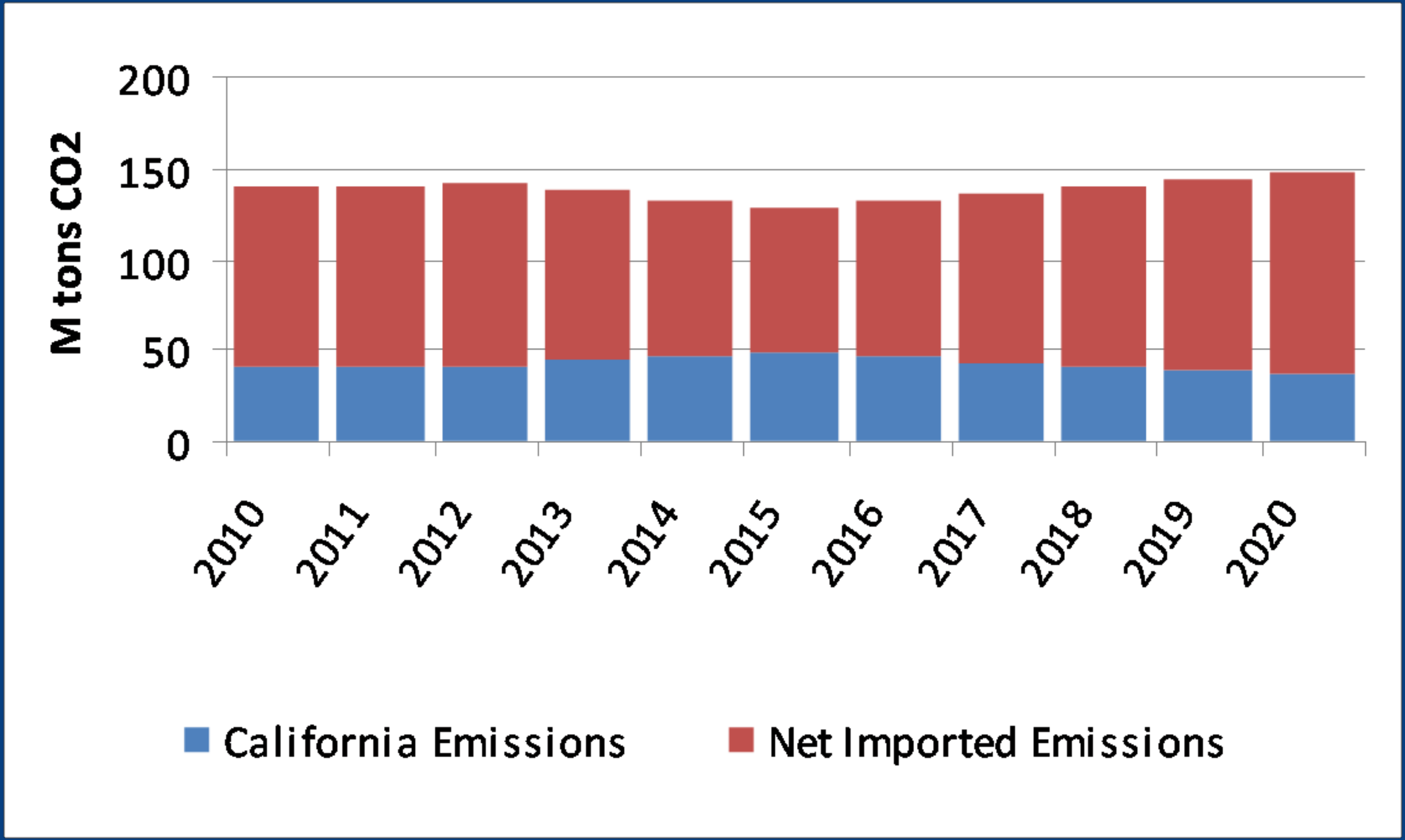
We use the model to identify the marginal emissions rate associated with imports into California.

Baseline Emissions and the AB32 Cap

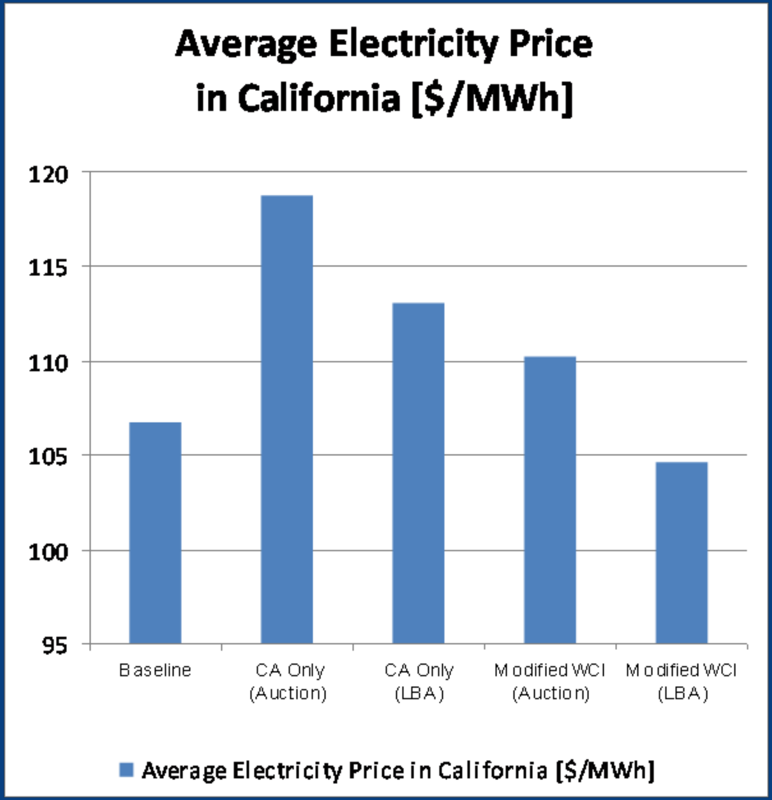


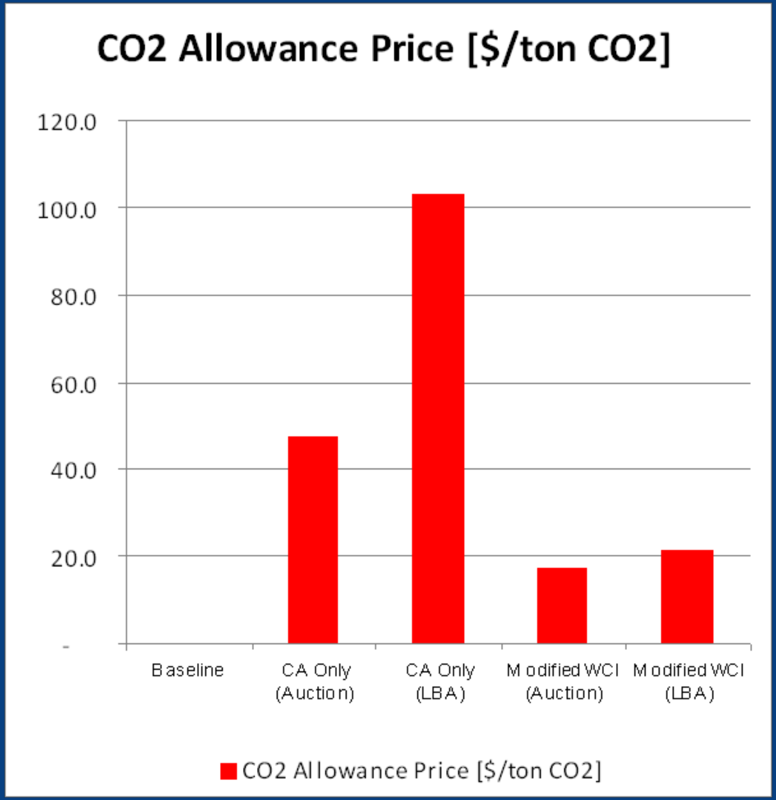
The decline in baseline emissions shows the effect of extending the REPTC indefinitely.

Baseline Emissions with No REPTC



Electricity and Allowance Price Effects of Allocation and Program Scope in 2020





Emissions Leakage in 2020 with CA-Only Cap-and-Trade Policy

	Auction	Load-Based Allocation
CO_2 Emission Reduction Target (M tons)	26.2	
CO_2 Emissions Reductions in West (M tons)	19.5	14.4
Leakage (%)	26%	45%

Conclusions: Allocation and Scope

- Load-based allocation will mute electricity price impacts of cap and trade but will raise overall program costs relative to an auction.
- Load-based allocation can result in greater emissions leakage.
- A cap-and-trade program that covers the entire west will prevent leakage, produce greater emissions reductions and do so at lower cost.
- In the first years of the CA program electricity users may have limited ability to respond to price changes.
- For CA GHG policy, a mixed approach of LBA and auction, phasing to total auction may be the best approach.